Final Report

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North Saskatchewan Beef Demonstration Project

Conducted by

Prince Albert Beef Producers Association

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NORTH SASKATCHEWAN BEEF DEMONSTRATION PROJECT

Abstract

The North Saskatchewan Beef Demonstration Project has been conducted to offer management information to interested beef producers. Information transfer was accomplished by tours, seminars and individual herd project. The individual herd project was conducted from a veterinarians perspective to supply management information with ADF supporting services "not normally delivered by the veterinarian". Management information included nutrition, reproduction, production, health and some financial.

The records were maintained with the use of software (Cowcalf) from Texas A&M. This information is meaningless unless a cost benefit can be offered or predicted with the use of an on farm integrated and production database with comparative analysis capability. This will permit analysis and prediction with as much known data as possible.

NORTH SASKATCHEWAN BEEF PROJECT

Comments

Beef is a very dynamic production unit with great variation in input expenses and production, therefore cost per unit produced. Market returns are also quite variable based on quality of product, season which reflects the supply and demand at that point in time.

Included are some brief observations and conclusions based on the project:

-need does not constitute demand. There is a great need for management information but there is not yet the interest.

-producers who gained the most from the project were the younger(25-35 year old) producers not yet financially secure with good curiosity and not a self professed expert. The good producers and financially secure producers were either not interested in joining the individual herd project or did not gain by information offered.

-the project as envisioned will not stand alone as a fee for service without government subsidization. Hoplefully information transfer has been acceptable during the time of the project.

-there is a need for producers to become more informed with there own financial position to achieve optimum return when marketing commodities on the open market. The public funding should assist in the creating of an online, current price of all sales by type, location, animal description and animal quantity. The price should be quoted on the high, low and median prices. Commentary on market influences could also be offered.

-the tools for the consultant or the farmer are not yet created to analyze cost effectiveness of recommendations to justify expense to the producer.

-a consultant complement producer management by providing service and management information on a timely cost effective basis.

-the database (Cowcalf from Texas A&M) which was used initiated a new record at calving with a new calf ID. This makes it very difficult to track the herd data from breeding to calving. This time period is significantly related to the productivity and profitability of the beef enterprize and the data must be preserve for future comparison.

-it was hoped that the producers would take the database and put it on the farms which have computers. This probably will not happen in this generation of farmers but certainly quite possible for the next generation.

-it is necessary to introduce the concept of net present value when making decisions for marketing this years calfcrop with the efficient utilization of feed inventory or how to develop grazing which will influence equity development for the next ten years.

-nutrition has the priority as the first management service which should be provided or adopted by the producer because it has a major influence on reproduction, production and financial return.

-producers should be encouraged to select bulls with excellent reproductive characteristics.

-fertility in the female breeding herd can be optimized by maintaining cow condition at critical times of the year.

-once producers get an appreciation of their present status they should be encouraged to set goals, evaluate and set goals.

NORTH SASKATCHEWAN BEEF PROJECT

Introduction

The North Saskatchewan Beef Project has been conducted to increase the pleasure and profitability of the beef enterprise through the improvement of management information and management ability. The Prince Albert Beef Producers Association (PABPA) was organized to manage the project and funding. The project was accomplished through the use of tours, seminars and an individual herd project. The objective was, and is, to maintain as much of the program as possible after the ADF funding has terminated.

The major emphasis of the seminars was the efficient utilization of feeds. The individual project had a major emphasis on nutrition (ration formulation and feeding animals to their productive/reproductive goals).

Seminars were held two to three times in the winter avoiding other activities and were well attended. Seminars and tours provided general information while the individual herd provided specific information to improve management or management decisions. Duration of the project did not allow the program to become well ingrained.

Tours

Members of the Prince Albert Beef Producers Assoc. attended the two annual Melfort Research Station livestock field days. It was my decision to tour the Research Station rather than any particular producer farm. Regardless, the tour was not well attended on either occasion due time of year and possibly a lack of interest.

Demonstrations by touring to producer premises were conducted on an individual or small group basis depending on the particular interest or need. Handling facilities and grazing were the main topics of interest.

Group tours for grazing were well handled in the area with a tour on the Don Anderson farm by another ADF project (New Pastures and Grazing Technologies Project). It is disappointing that very few local producers took advantage of the opportunity.

A tour of the expert to the premises with a need or interest was also conducted on two occasions. Bruce Johnson, Range Management Coordinator for the New Pastures and Grazing Technology Project, took time from his busy schedule to tour to the farms of local producers to advise on a specific problem not with generalities as with a seminar.

Seminars

The seminars were held in the winter months on three occasions annually. We attempted to avoid other meetings of producer interest, seasonal festivities and calving season. Seminars were timed early in December right after Agribition, third week of January and either in February or preferably April at the end of the majority of calving. Evening seminars worked the best starting at 7:30 pm and concluding at 10:30 pm with a coffee break and question period slotted into the time.

Seminars were organized with the assistance of the Agrep, Barry Swanson, who took the responsibility to rent the meeting room and notify the PABPA members and interested individuals. The seminars were at no cost to anyone wishing to attend.

Speakers:

Al Hingston, Livestock Br. of Sask. Ag. spoke on the importance of records in management and decision making.

Duane McCartney and Shabtai Bitman, Melfort Research Station spoke on recent research with respect to timing of calving, pasture forages, pasture fertilization and pasture systems.

Bob Maltman, Sask. Feed Testing Laboratory, spoke on the value of feed testing and ration formulation.

Brad Weidamen and Bill McQueen, Sask. Cattle Feeders Association, spoke on what they desire in a feeder animal and direct marketing with respect to terms and shrink.

Dr. Al Barth, Western College of Veterinary Medicine, spoke on bull evaluation and the value of a good reproductive program.

Dr. Claude Piche, Mereck Sharpe and Dome, spoke on parasite control and reported on some of the studies the company was conducting in Alberta.

Dr. Lyle Rode, Lethbridge Research Station, spoke on the value of good quality forages and the value of forage preservatives as they are marketed.

Dr. Robert Westra, Westra and Associates Inc, compared different harvesting systems and storage losses of forage.

Bruce Johnson, Rangeland Management Specialist, spoke on pasture forages and fencing. A member of Ducks Unlimited also spoke at the seminar about their marshland projects and how the producers could be involved.

Publications and Publicity

Publicity for the Beef Herd Management Project was done on one occasion in October 1988. Roger Mclaughlin, CKBI television in Prince Albert, held an on site interview at the farm of Paul Oleksyn during calf weighing at weaning.

As a result of the project the organizers of the Canadian Veterinary Medical Association Conference in Ottawa July 9-12, 1989 invited me to present a seminar on beef herd management. Dr. John Berezowski of Hudson Bay also presented papers at the seminar. The two papers, Beef Herd Management Program: Introduction and Beef Herd Management: Nutrition, which I presented at the seminar are included and reflect my feelings of beef herd management from a private practitioners perspective.

A short article, Bull Selection - What is Important?, was sent to producers participating in the individual herd project.

A feed cost comparison table was also created to reflect the comparative value of feeds based on local pricing.

Individual Herd Project

The basic philosophy of the beef herd management program (BHMP) is to improve the pleasure and profitability of production. Pleasure is derived through economic stability, management control and facility design. Allan Nation, editor of the Stockman/Grass Farmer, once quoted Sam Drucker saying there are three things that all businesses need to survive: liquidity, productivity and profitability. Profitability is based on widening the margin both in decreasing the expense and increasing income and increasing equity.

Economic stability is a prime prerequisite of pleasure of a beef enterprise. Possibly it is the point which determines the demise of the beef herd and the consultant. One must be conscious of liquidity before making exaggerated recommendations which incur a capital expense. It is also necessary to look beyond the beef herd to the beef enterprise to recognize greater deficiencies which could utilize spare capital and direct the producer to the proper specialist.

There is a saying, "if you can't measure, you can't manage." This should be altered to," if you don't measure, you can't manage". The practitioner must appreciate the level of interest with respect to herd or individual records, pregnancy diagnosis or bull evaluation. If the unit cannot be monitored for productivity a herd management program is futile.

Encourage good handling facilities to be able to handle the cattle in a quiet and efficient manner and wintering facilities, which are required to place animals in different feeding groups. Facilities do not have to be expensive to work well but are required for management intervention (Gary Smith's improvements). It is possible to participate in facility design by applying the principles of Temple Grandin and experience(mistakes) made or direct the producer to a specialist.

Profitability is a reflection of marketing, production and internal efficiency. The cash system only accounts for cashflow and does not readily account for the change in inventory or the youthfulness of the herd. The strength and vigor of the enterprise is based on a rolling herd maintaining a young age, or economic viability will decrease in the future.

Market timing, shrinkage and alternatives greatly influence the profitability. Preparation and packaging to capitalize on the seasonality of the market of both production and culls is significant. Market alternatives such as computer sale, satellite sale, local sale or direct marketing must be considered. This will influence decisions of when to pregnancy diagnose the cows and wean the calves. Presently this concept is just discussion for the members of the PABPA. There has been no change in the time of preg. checking to market the culls on a high price. As you can see from the budget model of a livestock enterprize marketing culls has a significant influence on income.

Production is based on reproduction, growth, length of calving and deathloss. Relative economic importance of reproduction, growth and carcass quality is 10:2:1. This does not mean that growth and carcass quality is forgotten, it is just put into perspective. As consumer demand for consistancy and quality increases, carcass quality will increase in significance. Therefore genetic base must also be considered in bull selecition.

Internal efficiency to reduce expense or to reduce waste will optimize production and profitability. Length of grazing season will influence the annual feed cost. The timely addition of deficient nutrients to lengthen the grazing season will reduce the annual feed cost. Preserved feeds are utilized to optimize the return per acre by minimizing harvesting, storage and feeding losses. It is necessary to feed to requirements being particularly conscious of cow condition to optimize reproduction.

Beef herd management is conducted with a perspective and appreciation of the total beef enterprise and its priority in the farm operation. With an appreciation of the commitment of the time and management of the producer it

gives the veterinarian the opportunity to add and complement labor and technical skills to optimize the information given to the producer for management decisions.

The management program is categorized into economics, nutrition, reproduction, production, health and records.

a. economics:
marketing - timing, packaging and market options.
productivity - weaning rate and growth rate most significant.
efficiency - optimize productivity per acre(controlled grazing and storage), grazing days and feed intake(feed preservation and harvesting).

b. nutrition: balance nutrients to meet targets and present production status. Target weight of replacements(to breeding and calving) and feeders to market based on weight, condition and timing. Nutrition is supplied to the cows based on cow condition and present production status. There five female feeding groups on the winter feeding period: nonpregnant replacements, pregnant replacements, pregnant first calf heifers, pregnant thin cows and pregnant cows in adequate condition. Body condition in the female herd is targeted for 5.3-6.0/9 from second trimester to the first three weeks post exposure.

c. reproduction: targets of replacements, cows and bulls.
replacements - target weight, pelvic measurement and expose to bulls 2 weeks prior to cows for 45 days.
cows - 95% pregnancy of cows exposed minus anticipated culls with a minimum of 60% of the calves in the first 21 days of 63 day breeding season.
bulls - scrotal circumference greater than 2 cm. above minimum(minimum to small testicles influence serving capacity, rate of conception, semen morphology?, productive lifespan of the bull and age of puberty of the female progeny). Producers are encouraged to utilize bulls which are rated excellent in the breeding soundness evaluation. After a breeding soundness has been conducted on a bull for two consecutive years, consideration is given to doing a physical exam only in multiple sire breeding units only.

d. production:
i) cattle: weaning rate - reflection of reproductive efficiency and deathloss.
weaning weight - reflection of genetics, milking ability and available pasture.
pregnancy rate and calving curve - reflection of nutrition, cow condition, average days since calving and bull efficiency.
deathloss - reflection of nutrition and disease management program.
ii) landbase: forage species, grazing reserve in

perennials and annuals, harvest and preservation methods to yield net return per acre. It is necessary to be aware of harvesting, storage and feeding loss to determine the actual yield per acre.

e. health: vaccination and treatment programs are based on risk, postmortems, serology, culture and sensitivity.

f. records: herd +/- individual record based. Computerized databases are available for the cowcalf herd, but developing a herd summary for evaluation is still not available. Summaries are necessary to look at the forest before the trees and determine what detail must be analyzed. This operation must be automated or it will not persist.

The project funding was for two years which ceased in May 1989. In that time period there were 1900 cows from 26 farms involved in the program in various stages of participation. There was only about 1000 cows from 13 farms which went on the complete program such as it is at the present stage of development. The present stage of development is:

a) individual animal identification and record database maintenance to yield an annual report of weaning weight, MPPA for the cows, bull productive performance and herd calving curve. The database is COWCALF from Texas A&M and it has its limitation in user ease and speed. Also the software does not offer all the desired herd summaries and the ones provided are slow to obtain. An example of the print out from the Blair Fisher herd is included.

b) reproductive monitoring through pregnancy diagnosis, bull evaluation and pelvic measurement of heifers.

c) feed collection, feed analysis and ration balancing on all animal groups. This segment has the main priority.

d) stimulation of curiosity about facilities, feed quality and grazing with the use of seminars and extension specialists.

e) interpretation and analysis of information obtained. This is the part of the program which is incomplete and the feed back time still has to be improved.

It has been a learning experience for the producer, technician and veterinarian. The technician and veterinarian were conducting the project on a part time basis. A herd management program must have a priority to the technician and veterinarian and the income must be there to give the program that position to succeed and have maximum benefit to the producer. Wherever possible a task is undertaken by the technician to free the veterinarian to conduct analysis and consultation.

It is from this project and a wealth of other sources of information what a herd management program consists of in my perception. The basic philosophy still consists of

improving pleasure and profitability through optimum productivity. This is still accomplished through seminars, tours and individual herd management program. But there is an order of priority to the components of beef herd management. These are in descending order economics, nutrition and reproduction. In reality, all are integrated because each component is dependent on the others for optimum results.

A minimum beef herd management program(BHMP) would consist of individual animal identification, herd records and analysis, feed collection and analysis, ration balancing, pregnancy diagnosis, breeding soundness evaluation, calving profile by age of dam in three groups, average steer and heifer weaning weights, postmortems and health recommendations. This program can be supplemented with individual herd records, least cost ration formulation, heifer prebreeding weights and pelvic measurement, more on farm monitoring and more interpretation & analysis.

Regardless of the program, it is important to have a contract detailing the responsibilities of the veterinarian, technician and producer. The method of payment must also be included in the contract. A general agreement contract was drawn between PABPA and producers in the individual herd program.

TABLE I Responsibilities of each individual in BHMP

	Veterinarian	Technician	Producer
records	analysis	data entry	gathering
nutrition	ration balance	feed collection	lab costs
reproduct	preg. check		
	bull eval.		
	pelvic repl.	weigh repl.+/-	weigh repl
product		weigh calv.+/-	weigh calv
health	postmortem		lab costs
	serology		lab costs
	herd problem		
	vaccines to use		vaccinate

Table I refers to the tasks and the division amongst individuals participating in the program. Table II is a list of the producers who participated in the individual herd project and table III refers to their level of participation. Table IV is a breakdown of the hours of the veterinarian and technician in the individual herd project.

Table V refers to the health related problems which were recorded and the aid of laboratory in diagnosis based on the quality of our submission. The number of samples refers to either a group or individual sample at one time.

The following is an outline to be included in each of the four annual visits in a herd management program. As our the program developed, this is what we attempted to strive for but certainly did not get accomplished.

Prebreeding:
-pelvic measurement of female and male yearling replacements
-bull evaluation: breeding soundness exam is done at clinic
-weight of replacement females
-monitor body condition of heifers and cows
-monitor disease and parasite control in calves
    lice: Ivomec
    coccidiosis: Deccox
    diarrhea and pneumonia: pen management
-record collection: anticipated culls, cows to be exposed, heifers to be exposed and spring calving data
-prebreeding vaccination recommendations(may be done in mid winter)

-technician enters spring data and generates calving and breeding reports.

Summer:
-monitor pasture
-monitor cow and bull condition
-recommendations on facility improvement, feed storage
-recommend pulling bulls if confident about conception
-fall vaccination program:
    backgrounding or marketing immediately
    what to order

-collect forage samples if late enough in the year or leave it to the technician.

Fall:
-pregnancy diagnosis
-weigh calves
-monitor body condition of bred females
-balance rations(2-3 hours per herd)

-technician enters fall data and generates calf, cow and bull performance summaries.

Midwinter: near the end of the second trimester
-monitor cow condition
-monitor lice
-recommendations of calving facility and postcalving areas
-recommendations precalving and prebreeding

what to order
-recommendations for disease prevention postcalving

Handling facility improvements was considered and/or accomplished by Gary Smith, Rod Zelensky, John Gondek, Andrew Herdin and Glen Herzog. After chasing cows up a lot of chutes, I know enough to be dangerous and offered advice on the design and construction. The input costs varied greatly but handling cattle was an improvement in all cases.

Improvement in length of breeding season was accomplished in the G. Smith herd by holding the late calving cows out of the forest reserve grazing and on a open grazing field for the breeding period.

Conclusions

The seminar program was the most successful component of the project as it was originally intended. Attendance was good with 35 to 70 people at each meeting. Most of the credit goes to the excellent speakers who kept the producer interest to continue to attend.

The individual herd project was designed in an attempt to coalesce data previously available and new data which the producer had not been exposed to before into a utlizable information base. This concept had a great many limitations since to my knowledge the necessary management tools are not yet developed.

The nutrition module was the most productive of all the components of the individual herd project. Having the technician gather feed samples worked well and in the last year the cost was an average of $40.00 per farm. Ration formulation was very successful except for having a timely weaning ration developed.

One must not forget that grazing on pasture is a significant portion of the nutrition. It was noted in the Glen Herzog herd that weaning weights can be affected by 100 pounds with poor quality pasture. G. Herzog had sold 10 cows to Brian Burgess. The next year the calves from the cows at Brian Burgess's were heavier which was attributed to the quality of pasture. It was also estimated that calves were 50 pounds lighter in the Doug Allen herd due to poor pasture and black flies and the Smeaton Community Pasture. This herd also had 12/87 cows open or late in the fall. As you note in table III non of these individuals are on the computer records and therefore this information is not documented but management changes in pasturing did occur as a result.

Table VI is an example of a ration which was balanced for one of the herds. We were striving for 3 pounds gain per

day but the dry matter intake(DMI) estimate is too high. Actually this herd went from 1.75/1.5/1.25 pounds per day gain in thirty day weighing periods. A water sample was also taken and the quality was good. The cause of the limited growth performance has been attributed to the quality of the grnfd/pea hay. Even though the feed analysis indicated good quality, the hay was baled at high moisture, tumble stacked and was very moldy. I think DMI was further reduced and performance hindered. This does indicate doing the ration formulation on the farm to get a total picture of the variables.

Many of the weaning rations were deficient in all nutrients which makes one must wonder why the calves grow, respond to vaccination or have a good nonspecific immunity with such a weaning ration. Therefore, I highly recommend that the weaning ration be formulated and created by weaning time.

Nutrition is an integral component of reproduction. Cow condition was the management technique stressed to producers to maintain good reproductive ability in the female herd. Heifers were weighed at weaning and the ration was formulated to gain the desired weight by breeding.

After nutrition, reproduction was considered to be the next most important module on which to concentrate. Bull selection and breeding soundness examination(BSE) were stressed but not fully utilized. Some producers used the BSE after the start of breeding to prove a bull to be suboptimum but failed to use the management technique prebreeding. The cost of a BSE was equated to one cow calving one heat period sooner in a calving period resulting in the heavier calf at weaning. I think it is not only the cost of a BSE but problems associated with delivering the bull for a BSE which make producers reluctant to utilize the service. I have stressed that the producer not be satisfied with a marginal bull, but select bulls with excellent breeding potential. A BSE can easily predict the excellent breeding potential bulls, but there is a very grey zone between satisfactory and questionable bulls.

Health advice was not given a priority in the last two years unless the problem or potential problem was blatant. I did not want to give the impression that this was a vaccine marketing herd health program.

The beef production database used for the project was Cowcalf which was developed at Texas A&M by Dr. Gary Rupp. It is slow and tedious and not a good prospect to transfer to the farm for maintenance. It is a production and health database with no financial integration. New records were initiated at calving which made it impossible to collect breeding data for analysis (ie. calves weaned per cow exposed minus anticipated culls). It was possible to

generate calving curves but grouping at the time of report was not possible which made generating reports tedious and time consuming. For these reasons, I do not recommend this software.

It was hoped that the computer records would be transferred to the producers at the completion of the project but this will not occur. The producers which presently have computers do not recognize them as a tool of any value for farm use. A person has to refamiliarize themselves with this software every time they use it and it is slow and difficult to use. Using a computer should be like riding a bike as it takes only a short time to get the rust out. If we felt insecure on a bike and if we were riding down a very narrow path, we would soon park it and let it gather dust while ignoring the new models coming out.

As you can note from the budget model of a beef enterprize feed costs comprise 60-70% of the annual expense. If the producer pastures cattle at a community pasture, 60-75% of the feed expense is under his control. If the producer pastures cattle at his/her own pasture, 94-96% of the feed expense is under his control.

Approximately 6% of feed expense is due to town purchases which is not very significant. The feed cost comparison did more than compare feeds to be purchased. It gave an appreciation of the value of feed grown on the farm and the care and attention it deserves.

What is really restricting is the inability to do a cost benefit analysis on any of the management services delivered whether it be pregnancy diagnosis, pelvic measurements of replacements, breeding soundness examinations, feed testing, ration formulation, weaning weights or maintenance of production records in a computer database. Whether these services are delivered on a fee for service basis or publicly funded with the such of ADF, they must be cost effective and shown to be so.

Presently, we rely on published information to justify management services but it must be more applied to the producer's own financial, feed and facility circumstance. In my opinion, what is required is an integrated accounting and production database on the farm with input as easy as using a microwave oven. An accessory to this would be marketing information (actual, predicted and forcasted) which can be introduced into analysis reports to aid in marketing. Table VII is an example of a report which would aid in the marketing of calves. It is very incomplete in the list of accounts but the idea is there. This function must be real time and not historical because historical information makes our vision 20-20 only in hindsight.

The project at times has been interesting, frustrating and at all times challenging. Park Range Veterinary Services contracted to the PABPA to conduct the project for $25.00 (increased to $32.50 in the second year) per hour plus travelling expenses when most of the herd work and herd management is done at $50.00 - $80.00 per hour for other species and beef herds. When reviewing the time and travel sheet, I can note countless hours that have not been included on the time sheet in organizing seminars and enjoying on farm visits.

Accomplishing the tasks of the project was designed to be done in spare time and off hours but what was originally a hobby became work below the cost of maintenance of the business. As the number of producers on the individual herd project grew to greater than 25, it became obvious that the limit was being reached in physical capability to conduct the project as perceived. I would never do this again or advise anyone else to conduct a project as a learning experience. As the other business developed, $80.00 per hour work takes priority over $25.00 per hour work, therefore time dedication to the task and quality of work suffers.

Over the two year period, three technicians were involved in the project. The first was not self motivated and the other two worked only on a part time basis since they were full time farmers. It was very enjoyable working with the technicians which were self motivated and could comprehend their tasks with a minimal amount of explanation.

Producer response has been positive to the project and it is felt that it was of significant value to their operation. They would like to see the project extended but cannot justify to themselves bearing the full cost of the program. One producer was concerned about not being fully informed about the project and another producer was concerned about the predictability of the pregnancy diagnosis. This inquiry was aborted with the necessity to conclude the project.

In conclusion, beef herd management is a broad program. The enhancement of management is to improve the pleasure and profitability. One must be conscious of the interest and economic status of the enterprise. The veterinarian should complement the producer's management skills and attempt to analyze the beef enterprise with respect to the total operation. There is a minimum level of information gathering below which a BHMP is nonfunctional and futile. The program has specific tasks to be accomplished by each individual. Nutrition will not work unless feed samples are gathered and there is timely ration balancing. A BHMP can be as intensive as desired by the client and the ingenuity of the veterinarian.

TABLE II

PRINCE ALBERT BEEF PRODUCERS INDIVIDUAL HERD PROJECT
PROJECT MEMBERS

LAST NAME	FIRST NAME	ADDRESS	TOWN	POST CDE
ALLEN	DOUG	BOX 1926	PRINCE ALBERT	
AUSTIN	GERALD	BOX 108	PADDOCKWOOD	S0J 1Z0
BECKMAN	RAY	BOX 126	PADDOCKWOOD	S0J 1Z0
BURGESS	BRIAN		MAYVIEW	S0J 1S0
CARUK	ORVAL		WEIRDALE	S0J 2Z0
ELLIOTT	STEWART	BOX 1351	PRINCE ALBERT	S6V 5S9
EVANS	ALLAN	GEN. DEL.	HAGEN	S0J 1B0
EVANS	DARRIN & LYLE	BOX 52	BIRCH HILLS	S0J 0G0
FISHER	BLAIN	SITE 1 BX 16 RR1	CHRISTOPHER LAKE	S0J 0N0
FOSTER	DALE & MURRY		BIRCH HILLS	S0J 0G0
FOSTER	DENNY	BOX 382	BIRCH HILLS	S0J 0G0
GONDEK	JOHN	RR1	PRINCE ALBERT	S6V 5P8
GRAY	ALEX	BOX 313	PRINCE ALBERT	S6V 5R7
HERDIN	ANDREW	RR1	SHELLBROOK	S0J 0G0
HERZOG	GLEN		MAYVIEW	S0J 1S0
KERNOHAN	SID	BOX 129	MACDOWALL	S0J 2S0
KOSAWAN	GERALD	BOX 141	MEATH PARK	S0J 1T0
KRISTENSEN	EARLING	BOX 2754	PRINCE ALBERT	
LANGFORD	TOM	BOX 24	SPRUCE HOME	S0J 2N0
LATO	DON	BOX 6	SPRUCE HOME	S0J 2N0
MUIRHEAD	WARD	RR1	SHELLBROOK	S0J 2E0
OLEKSYN	TIM	BOX14 S15 RR1	SHELLBROOK	S0J 2E0
RUSZKOWSKI	PETER	BOX 717	PRINCE ALBERT	S6V 5S2
SLATER	DAVE	RR 1	CHRISTOPHER LK.	S0J 0N0
SMITH	GARRY		MACDOWALL	S0K 2S0
WIBERG	BERNIE	RR1	CHRISTOPHER LK	S0J 1Z0
WILSON	DOUG	RR5 S15 BX2	PRINCE ALBERT	
ZELENSKY	ROD	RR4	PRINCE ALBERT	S6V 5R2

TABLE III

PRINCE ALBERT BEEF PRODUCERS INDIVIDUAL HERD PROJECT
MANAGEMENT FUNCTIONS BEING COMPLETED AT END OF PROJECT

LAST NAME	FIRST NAME	START	FINISH	FEED TST	RATIONS	COW ID	PREG DX.	BSE	WEAN WTS	COMP REC
ALLEN	DOUG	OCT 88	MAY 89			1	1	1	1	
AUSTIN	GERALD	NOV 87	MAY 89	1	1	1			1	
BECKMAN	RAY	MAR 87	MAY 89	1	1	1	1	1	1	1
BURGESS	BRIAN	AUG 87	MAY 89	1	1					
CARUK	ORVAL	MAR 87	MAY 89	1	1	1	1		1	1
ELLIOTT	STEWART	MAR 87	MAY 89	1	1	1				
EVANS	ALLAN	MAR 87	MAY 89	1	1		1		1	
EVANS	DARRIN & LYLE	JAN 88	MAY 88							
FISHER	BLAIN	JUN 87	MAY 89	1	1	1	1		1	1
FOSTER	DALE & MURRY	JUL 87	AUG 88	1	1	1	.5			
FOSTER	DENNY	MAR 87	MAY 89	1	1	1	1	1	1	
GONDEK	JOHN	MAR 87	MAY 89	1	1	1	1		1	1
GRAY	ALEX	MAR 87	MAY 89	1		1	1	1		1
HERDIN	ANDREW	MAR 87	MAY 89	1	1	1	1	1	1	1
HERZOG	GLEN	MAR 87	MAY 89	1	1					
KERNOHAN	SID	MAR 87	MAY 89	1	1	1	1		1	1
KOSMAN	GERALD	MAR 87	MAY 89	1	1	1	1		1	1
KRISTENSEN	EARLING	MAR 87	JAN 88							
LANGFORD	TOM	MAR 87	MAY 89	1	1	1		1	1	1
LATO	DON	OCT 88	MAY 89	1	1	1	1		1	
MUIRHEAD	WARD						1			
OLEKSYN	TIM	MAR 87	MAY 89	1	1	1	1	1	1	1
RUSZKOWSKI	PETER	MAR 87	MAY 89	1	1	1	1		1	1
SLATER	DAVE	MAR 87	MAY 89	1	1	1	1	1	1	1
SMITH	BARRY	MAR 87	MAY 89	1	1	1	1	1	1	1
WIBERG	BERNIE	MAR 87	MAY 89	1	1	1	1	1	1	1
WILSON	DOUG	MAR 87	MAY 89	1		1			1	1
ZELENSKY	ROD	MAR 87	MAY 89	1	1	1	1		1	1
28	TOTALS	0	0	24	22	22	19.5	10	20	16

START- APPROX. TIME OF JOINING THE PROJECT
FINISH- APPROX. TIME OF LEAVING THE PROJECT
FEED TST- FEED TESTING AND COLLECTION SUPPORTED BY ADF
RATIONS- RATION FORMULATION SUPPORTED BY ADF
COW ID- HERDS WITH BREEDING STOCK HAVING INDIVIDUAL IDENTIFICATION
PREG DX.- PREGNANCY DIAGNOSIS BEING CONDUCTED IN THE HERD
BSE- BREEDING SOUNDNESS EXAMINATIONS ON BULLS PREBREEDING
WEAN WTS- WEIGHING CALVES AT WEANING SUPPORTED BY ADF
COMP REC- HERDS WHICH ENTERED RECORDS IN THE COMPUTER DATABASE(COWCALF)

TABLE IV

PRINCE ALBERT BEEF PRODUCERS INDIVIDUAL HERD PROJECT
TOTAL PERSONELL TIME AND TRAVEL

LAST NAME	FIRST NAME	TECH TIME	TECH KM.	VET TIME	VET KM.
ALLEN	DOUG	8.0			
AUSTIN	GERALD	29.0	595	13.0	355
BECKMAN	RAY	10.0	155	5.5	55
BURGESS	BRIAN	5.5	130	7.0	120
CARUK	ORVAL	35.0	577	11.0	280
ELLIOTT	STEWART	12.0	117	8.5	40
EVANS	ALLAN	6.5	100	2.0	
EVANS	DARRIN & LYLE			.5	
FISHER	BLAIN	35.5	557	13.0	380
FOSTER	DALE & MURRY	13.0	210	6.0	80
FOSTER	DENNY	17.0	260	2.0	40
GONDEK	JOHN	19.5	304	24.5	250
GRAY	ALEX	14.0	52	2.0	15
HERDIN	ANDREW	20.0	391	13.0	190
HERZOG	GLEN	8.5	223	21.5	160
KERNOHAN	SID	24.0	316	10.5	215
KOSAWAN	GERALD	37.5	567	11.5	220
KRISTENSEN	EARLING	14.5	231	2.0	30
LANGFORD	TOM	40.5	453	7.0	90
LATO	DON	6.0	140	2.0	
MUIRHEAD	WARD	3.0	150		
OLEKSYN	TIM	17.5	194	13.0	250
RUSZKOWSKI	PETER	32.5	441	16.5	252
SLATER	DAVE	34.0	411	3.0	80
SMITH	GARRY	26.5	289	12.0	160
WIBERG	BERNIE	26.0	490	20.0	290
WILSON	DOUG	8.5	30	7.0	10
ZELENSKY	ROD	36.0	254	23.5	384
28	TOTALS	540.0	7637	257.5	3946

TIME IN HOURS DISTANCE IN KM.

TABLE V

PRINCE ALBERT BEEF PRODUCERS INDIVIDUAL HERD PROJECT

LAST NAME	FIRST NAME	HEALTH RELATED SAMPLING POSTMORTEMS SAMPLES	POS. DX.	WATER SAMPLES	TRACE MINERALS SAMPLES		CLINICAL PATHOLOGY SAMPLES	POS. DX.	MICROBIOLOGY SAMPLES	POS. DX.
ALLEN	DOUG	2								
AUSTIN	GERALD	3	2	1	2		1		1	
BECKMAN	RAY	2	2							
BURGESS	BRIAN									
CARUK	ORVAL	7	3							
ELLIOTT	STEWART	2					1		2	1
EVANS	ALLAN	1	1							
EVANS	DARRIN & LYLE									
FISHER	BLAIN	1			2				2	2
FOSTER	DALE & MURRY									
FOSTER	DENNY									
GONDEK	JOHN	5	2							
GRAY	ALEX	3	2						1	1
HERDIN	ANDREW	4	2		1					
HERZOG	GLEN									
KERNOHAN	SID									
KOSAWAN	GERALD	3	2							
KRISTENSEN	EARLING									
LANGFORD	TOM									
LATO	DON									
MUIRHEAD	WARD									
OLEKSYN	TIM	2	1		1		2		4	
RUSZKOWSKI	PETER	5	3							
SLATER	DAVE	1	1							
SMITH	GARRY								1	
WIBERG	BERNIE	5	2							
WILSON	DOUG	3	2		1		1		1	1
ZELENSKY	ROD								4	1
28	TOTALS	49	25	1	7	0	5	0	16	6

EACH NUMBER INDICATES INDIVIDUAL OR GROUP SAMPLING
POSTMORTEMS SUPPORTED BY ADF
LABORATORY FEES NOT SUPPORTED BY ADF UNLESS IT WAS A HERD INVESTIGATION

TABLE VI

RATION FOR ----- LESTER AND GERALD AUSTIN
FEEDERS 800 LBS @ 3.0 LBS/DAY
21-Nov-88

Ration number 1
ADG is— 3 lbs. Milk/dy-- 0 L/cow or 0 lb/cow "ERR"-means no entry made.
Number of head--) 47 Days of feeding--) 35
1000 lbs/Batch of grain mix.

	INTAKE/HD/DAY & COST kg DM	lb AF	$/day	Per lot lb/day AF	Total/ Period lbs	GRAIN MIX lbs per 100 lbs mix	lbs per batch	Nutrient Content (as fed basis)			
Grnfd/pea	1.6	4.17	$.14	196.2	6,867						
Wht grnfd	2	5.07	$.14	238.2	8,337					mg/kg	
Alf/brom	.8	2.04	$.06	95.9	3,358	(%)		$124	cost/tonne	59.3	zinc
Oats	0	.00	$.00	.0	0	.00	.00	12.7	% protein	19.2	copper
Barley gr	4.7	11.34	$.62	532.8	18,649	99.36	993.56	75.37	% TDN	.290	selenium
C.Silage2	0	.00	$.00	.0	0	.00	.00	.14	% calcium	28.8	manganes
CanolMeal	0	.00	$.00	.0	0	.00	.00	.41	% phosphorus	127.8	iron
CpBf42-14	0	.00	$.00	.0	0	.00	.00	.25	% salt	.32	cobalt
Limestone	0	.00	$.00	.0	0	.00	.00	2734	IU vit.A/lb	.96	iodine
16:16 Min	.02	.04	$.01	2.1	73	.39	3.86	8	IU vit.E/lb	.00	molybden
CoopTMS	.01	.02	$.00	1.1	37	.20	1.99	.03	% magnesium		
Cp-ADE	0	.00	$.00	.0	0	.00	.00	.03	% sulfur		
Lv-ADE/Se	.003	.01	$.01	.3	11	.06	.58	.09	% potassium		
								.00	% lysine		
Total	9.1	22.7	$.98	1066.6	37,331	100	1000	.00	% methionine		
DMI/BW--)	2.52%		COST----)	$45.89	$1,606						

	ADG lb	Milk L/day	Cost $/day	Protein Kg	TDN Kg	Calcium Kg	Phos Kg	Vit. A K.I.U.	Vit. E. I.U.	Zinc mg/kg	Copper mg/kg	Selenium mg/kg
/hd/day												
Supplied)			$.98	1.38	6.5	.041	.032	36	120.5	43	12	.18
) in Dry Matter				15.1%	1.3	:1 C:P ratio		17.0	:1 N:S ratio		ERR	:1 Cu:Mo
Required)	3	0		.94	6.5	.036	.022	30	160	40	10	.2
	% Protein as fed-)			13.4%								

	Salt %	Manganese mg/kg	Iron mg/kg	Cobalt mg/kg	Iodine mg/kg	Molybdenu mg/kg	Magnesium %	Sulfur %	Potassium %	Lysine %	Methionine %
Supplied	.26%	30	171	.20	.54	.00	.27%	.14%	1.08%	.00%	.00%
Required	.25	45	75	.1	.75	0	.18%	.18%	.95%	.00%	.00%

Based on the information provided, and the feed analysis available, this formulation provides the nutrients listed, compared to the determined requirements shown. The grain mix shows the combination of feeds to use per 100 lbs of mix and per batch. When fed at this level (assuming normal appetite) the daily intake per head should be 5.2 kgs (or 11.4 lbs) of grain mix and 11.3 lbs of roughage. The feed cost per hl of milk would be ERR /hl. Feed cost for gain would be $.33 /lb. "ERR" means no entry made for the computor to calculate from, eg. ADG, milk/day, etc.

Nutritionist------

TABLE VII

BUDGET MODEL FOR FEEDING OR FINISHING CALVES 100 CALVES

CALVES SHRUNK WT	450	495	550	610	670	740	810	885
CALVES MARKET PR	1.07	1.07	1.00	.98	.95	.90	.86	.80

ACCOUNTS	MONTHS													
ASSETS	AUG		SEPT		OCT		NOV		DEC		JAN		FEB		MAR
	BUDG.	ACT.	BUDG.	ACT.	BUDG.	ACT.	BUDG.	ACT.	BUDG.	ACT.	BUDG.	ACT.	BUDG.	ACT.	BUDG.
INVENTORY															
GRAIN	4200		3580		3254		2893		2492		2051		1565		1033
HAY	1500		1500		1500		1500		1500		1500		1500		1500
SILAGE	10000		8862		7648		6357		4968		3503		1970		390
STRAW	1500		1410		1320		1230		1140		1050		960		870
CALVES	48150		52965		55000		59780		63650		66600		69660		70800
TOTAL ASSETS	61150		64737		65468		68867		71258		72653		74090		73560
EXPENSES															
FIXED															
CAP. INT	12000		12000		12000		12000		12000		12000		12000		12000
DEPRECIA	10000		10000		10000		10000		10000		10000		10000		10000
VARIABLE															
OPER. IN	583		1167		1750		2333		2917		3500		4083		4667
FUEL	50		100		150		200		250		300		350		400
REPAIRS	20		40		60		80		100		120		140		160
WAGES	120		240		360		480		600		720		840		960
TOTAL EXPENSES	22773		23012		23251		23489		23728		23966		24205		24444
TOTAL NET VALUE	38377		41726		42217		45377		47530		48686		49885		49116

OPERATING LOAN 50000 AT INTEREST OF 14 PERCENT
TAX IMPLICATIONS NOT CONSIDERED
EXAMPLE ONLY AND ALL COSTS ARE ESTIMATES FOR DEMONSTRATION ONLY

BEEF HERD MANAGEMENT PROGRAM: INTRODUCTION

presented to Canadian Veterinary Assoc. Conf. July 12, 1989

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This beef herd management program has a structure based on philosophy, priorities, services to be offered and details of the service. This program would not have been possible with out the contribution of the Agricultural Development Fund, a joint federal/provincial funding.

Management is defined as the act, art or manner of controlling or managing. The definition of the verb to manage is to control the movement or behavior of. Beef herd management can be defined as the monitoring of the total beef enterprise with analysis and interpretation and reaction to the consequence. A beef herd management program is the complementing of the producer's management to encompass the total beef enterprise. The program supplies solely management information to the producer and must be done so on a cost effective basis to be viable.

My inputus to initiate a beef herd management program has come from many sources.
a. Lack of nutritional knowledge to make trace mineral recommendations, evaluate rations or formulate rations for producers. This prompted further education in nutrition.
b. Feed companies were stocking more health care products and programs.
c. Reproductive, nutritional and disease problems were repeating on the same farm year after year. Producers either considered their beef enterprise to be a great asset or great liability.
d. The programs delivered by government were segmented portions of management. Records on herd basis, community pasture pregnancy diagnosis and nutrition were some of the programs offered on a limited time basis.
e. Dr. John Berezowski of Hudson Bay, Sask. initiated health care programs with funding by the Economic Regional Development Agreement.

The basic philosophy of the beef herd management program is to improve the pleasure and profitability of production. Pleasure is derived through economic stability, management control and facility design. Allan Nation, editor of the Stockman/Grass Farmer, once quoted Sam Drucker saying there are three things that all businesses need to survive: liquidity, productivity and profitability. Profitability is

based on widening the margin both in decreasing the expense and increasing income and increasing equity.

Economic stability is a prime prerequisite of pleasure of a beef enterprise. Possibly it is the point which determines the demise of the beef herd and the consultant. One must be conscious of liquidity before making exaggerated recommendations which incur a capital expense. It is also necessary to look beyond the beef herd to the beef enterprise to recognize greater deficiencies which could utilize spare capital and direct the producer to the proper specialist.

There is a saying, "if you can't measure, you can't manage." This should be altered to," if you don't measure, you can't manage". The practitioner must appreciate the level of interest with respect to herd or individual records, pregnancy diagnosis or bull evaluation. If the unit cannot be monitored for productivity a herd management program is futile.

Encourage good handling facilities to be able to handle the cattle in a quiet and efficient manner and wintering facilities, which are required to place animals in different feeding groups. Facilities do not have to be expensive to work well but are required for management intervention. It is possible to participate in facility design by applying the principles of Temple Grandin and experience(mistakes) made or direct the producer to a specialist.

Profitability is a reflection of marketing, production and internal efficiency. The cash system only accounts for cashflow and does not readily account for the change in inventory or the youthfulness of the herd. The strength and vigor of the enterprise is based on a rolling herd maintaining a young age, or economic viability will decrease in the future.

Market timing, shrinkage and alternatives greatly influence the profitability. Preparation and packaging to capitalize on the seasonality of the market of both production and culls is significant. Market alternatives such as computer sale, satellite sale, local sale or direct marketing must be considered. This will influence decisions of when to pregnancy diagnose the cows and wean the calves.

Production is based on reproduction, growth, length of calving and deathloss. Relative economic importance of reproduction, growth and carcass quality is 10:2:1. This does not mean that growth and carcass quality is forgotten, it is just put into perspective.

Internal efficiency to reduce expense or to reduce waste will optimize production and profitability. Length of

grazing season will influence the annual feed cost. The timely addition of deficient nutrients to lengthen the grazing season will reduce the annual feed cost. Preserved feeds are utilized to optimize the return per acre by minimizing harvesting, storage and feeding losses. It is necessary to feed to requirements being particularly conscious of cow condition to optimize reproduction.

Beef herd management is conducted with a perspective and appreciation of the total beef enterprise and its priority in the farm operation. With an appreciation of the commitment of the time and management of the producer it gives the veterinarian the opportunity to add and complement labor and technical skills to optimize the information given to the producer for management decisions.

The management program is categorized into economics, nutrition, reproduction, production, health and records.

a. economics:
marketing - timing, packaging and market options.
productivity - weaning rate and growth rate most significant.
efficiency - optimize productivity per acre(controlled grazing and storage), grazing days and feed intake(feed preservation and harvesting).

b. nutrition: balance nutrients to meet targets and present production status. Target weight of replacements(to breeding and calving) and feeders to market based on weight, condition and timing. Nutrition is supplied to the cows based on cow condition and present production status. There five female feeding groups on the winter feeding period: nonpregnant replacements, pregnant replacements, pregnant first calf heifers, pregnant thin cows and pregnant cows in adequate condition. Body condition in the female herd is targeted for 5.3-6.0/9 from second trimester to the first three weeks post exposure.

c. reproduction: targets of replacements, cows and bulls.
replacements - target weight, pelvic measurement and expose to bulls 2 weeks prior to cows for 45 days.
cows - 95% pregnancy of cows exposed minus anticipated culls with a minimum of 60% of the calves in the first 21 days of 63 day breeding season.
bulls - scrotal circumference greater than 2 cm. above minimum(minimum to small testicles influence serving capacity, rate of conception, semen morphology?, productive lifespan of the bull and age of puberty of the female progeny). Producers are encouraged to utilize bulls which are rated excellent in the breeding soundness evaluation. After a breeding soundness has been conducted on a bull for two consecutive years, consideration is given to doing a physical exam only in multiple sire breeding units only.

d. production:

i) cattle: weaning rate - reflection of reproductive efficiency and deathloss.

weaning weight - reflection of genetics, milking ability and available pasture.

pregnancy rate and calving curve - reflection of nutrition, cow condition, average days since calving and bull efficiency.

deathloss - reflection of nutrition and disease management program.

ii) landbase: forage species, grazing reserve in perennials and annuals, harvest and preservation methods to yield net return per acre. It is necessary to be aware of harvesting, storage and feeding loss to determine the actual yield per acre.

e. health: vaccination and treatment programs are based on risk, postmortems, serology, culture and sensitivity.

f. records: herd +/- individual record based. Computerized databases are available for the cowcalf herd, but developing a herd summary for evaluation is still not available. Summaries are necessary to look at the forest before the trees and determine what detail must be analyzed. This operation must be automated or it will not persist.

NORTH SASKATCHEWAN BEEF DEMONSTRATION PROJECT

The basic philosophy was to improve the pleasure and profitability of the beef enterprise. The project was to supply information from seminars, tours and individual herd management program. The funding of the program was designed to cover the cost of seminars, tours, a veterinarian and technician. The tasks not regularly done for fee by a veterinarian were covered by the funding (postmortems on the first deathloss, record database maintainance, nutrition, feed collection and working up herd problems) for I did not see the necessity to fund cost effective management procedures already done (pregnancy diagnosis and bull evaluation).

The Prince Albert Beef Producers Association was created to manage the funding and be a stimulus for future progress. The initial purpose of the group was:

a) to evaluate and improve herd profitability within herds (ie. weaning weights, breeding success and nutrition).

b) to demonstrate the value of corrals and chutes to improve the management and pleasure of a beef operation.

c) to organize educational events for beef producers.

d) to increase awareness of marketing (product demand, alternatives, timing).

The project funding was for two years which ceased in May 1989. In that time period there were 1900 cows from 26

farms involved in the program in various stages of participation. There was only about 1000 cows from 13 farms which went on the complete program such as it is at the present stage of development. The present stage of development is:

a) individual animal identification and record database maintainance to yield an annual report of weaning weight, MPPA for the cows, bull productive performance and herd calving curve. The database is COWCALF from Texas A&M and it has its limitation in user ease and speed. Also the software does not offer all the desired herd summaries and the ones provided are slow to obtain.

b) reproductive monitoring through pregnancy diagnosis, bull evaluation and pelvic measurement of heifers.

c) feed collection, feed analysis and ration balancing on all animal groups. This segment has the main priority.

d) stimulation of curiosity about facilities, feed quality and grazing with the use of seminars and extension specialists.

e) interpretation and analysis of information obtained. This is the part of the program which is incomplete and the feed back time still has to be improved.

It has been a learning experience for the producer, technician and veterinarian. The technician and veterinarian were conducting the project on a part time basis. A herd management program must have a priority to the technician and veterinarian and the income must be there to give the program that position to succeed and have maximum benefit to the producer. Wherever possible a task is undertaken by the technician to free the veterinarian to conduct analysis and consultation.

It is from this project and a wealth of other sources of information what a herd management program consists of in my perception. The basic philosophy still consists of improving pleasure and profitability through optimum productivity. This is still accomplished through seminars, tours and individual herd management program. But there is an order of priority to the components of beef herd management. These are in descending order economics, nutrition and reproduction. In reality, all are integrated because each component is dependent on the others for optimum results.

A minimum beef herd management program (BHMP) would consist of individual animal identification, herd records and analysis, feed collection and analysis, ration balancing, pregnancy diagnosis, breeding soundness evaluation, calving profile by age of dam in three groups, average steer and heifer weaning weights, postmortems and health recommendations. This program can be supplemented with individual herd records, least cost ration formulation,

heifer prebreeding weights and pelvic measurement, more on farm monitoring and more interpretation & analysis.

Regardless of the program, it is important to have a contract detailing the responsibilities of the veterinarian, technician and producer. The method of payment must also be included in the contract.

TABLE Responsibilities of each individual in BHMP

	Veterinarian	Technician	Producer
records	analysis	data entry	gathering
nutrition	ration balance	feed collection	lab costs
reproduct	preg. check bull eval. pelvic repl.	weigh repl.+/-	weigh repl
product		weigh calv.+/-	weigh calv
health	postmortem serology herd problem vaccines to use		lab costs lab costs vaccinate

The following is an outline to be included in each of the four annual visits in a herd management program:

Prebreeding:
-pelvic measurement of female and male yearling replacements
-bull evaluation: breeding soundness exam is done at clinic
-weight of replacement females
-monitor body condition of heifers and cows
-monitor disease and parasite control in calves
  lice: Ivomec
  coccidiosis: Deccox
  diarrhea and pneumonia: pen management
-record collection: anticipated culls, cows to be exposed, heifers to be exposed and spring calving data
-prebreeding vaccination recommendations(may be done in mid winter)

-technician enters spring data and generates calving and breeding reports.

Summer:
-monitor pasture
-monitor cow and bull condition
-recommendations on facility improvement, feed storage
-recommend pulling bulls if confident about conception

-fall vaccination program:
    backgrounding or marketing immediately
    what to order

-collect forage samples if late enough in the year or leave it to the technician.

Fall:
-pregnancy diagnosis
-weigh calves
-monitor body condition of bred females
-balance rations(2-3 hours per herd)

-technician enters fall data and generates calf, cow and bull performance summaries.

Midwinter: near the end of the second trimester
-monitor cow condition
-monitor lice
-recommendations of calving facility and postcalving areas
-recommendations precalving and prebreeding
    what to order
-recommendations for disease prevention postcalving

In conclusion, beef herd management is a broad program. The enhancement of management is to improve the pleasure and profitability. One must be conscious of the interest and economic status of the enterprise. The veterinarian should complement the producer's management skills and attempt to analyze the beef enterprise with respect to the total operation. There is a minimum level of information gathering below which a BHMP is nonfunctional and futile. The program has specific tasks to be accomplished by each individual. Nutrition will not work unless feed samples are gathered and there is timely ration balancing. A BHMP can be as intensive as desired by the client and the ingenuity of the veterinarian.

BEEF HERD MANAGEMENT: NUTRITION

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Presented to: CVMA Conference, Ottawa, Ont. July 12, 1989

Nutrition has the greatest economic significance of beef herd management. It is the component that has been accomplished in the most complete form. Not only effecting the key indicators of the beef herd itself but reflecting performance to the land base if present. Obtaining optimum production from dedicated landbase is the main criteria whether the commodities are marketed directly or converted to beef and marketed. Grazing, drylot feeding and ration balancing are the segments of nutrition under consideration.

There is a direct relationship between nutrition and economics with respect to health, reproduction, and growth. It is important to balance the rations to satisfy the status and productivity of the animal with no major excesses or deficiencies. It is necessary to be conscious of quality and quantity of on farm produced feeds in order to complement the stage of production of the animal with minimal purchased feeds.

The inherent nonspecific immunity is influenced by both the macro and micro nutrients. The ability of the animal to mount an immune response to either natural infection or vaccination is directly influenced by nutritional status. Griebel P. et al. found a decreased lymphocyte response in dairy calves with deficient nutritional status. Deficiency in vitamins and minerals also leads to clinical symptoms or reduced productivity. But adding trace minerals to a diet individually can induce a deficiency status in another trace mineral through competitive absorption. It is more productive and easier to balance the ration than to effect a remedy one at a time.

Reproduction in the female herd is most critically related to nutritional status. Not only the balance of vitamins and minerals but the body condition of the productive females and the target weight of the heifers at the time of breeding. Adequate energy and protein is especially critical to maintain cow body condition:

a. from the start of the third trimester through the first three weeks of breeding to ensure optimum contribution to conception by the female.

b. during the second and third trimester to avoid one cause of weak calf syndrome.

c. to contribute to adequate quantity and quality of colostrum.
d. for good neonatal vigor by the calf and the ability to absorb colostrum.

GRAZING

Grazing is the time of the year with low labor and capital input into the cow herd. It is also the season in most herd when conception and calf growth is occurring which has a great effect on production. Productivity is quite variable due to grazing preferences and management.

There are a multitude of terms to label grazing management: forage management, high intensity and short frequency grazing, rotational grazing management and intensive range management(IRM). All are referring to means of increasing stocking density and stocking rate. Through non selective grazing and long rest period, the plant productivity of the pasture should be improved.

Spring pasture is approximately 85% moisture which can result in insufficient energy due to the limit rumen fill to maintain breeding condition. At times the dry matter intake(DMI) is inadequate on spring lush and energy supplementation is required. Therefore supplement energy to complement the high protein content with high soluble component.

Growth is determined by pasture availability. As the calf gets older, milk production decreases and the calf DMI increases. In one case, weaning weight was influenced by 100 pounds due to limited pasture. Weaning weight determines productivity of the cow, value of the calf at weaning, quantity & quality of protein required in the weaning ration and viability of the calf. Weaned calf treatment rate is correlated to the weight at weaning.

It is desireable to have the cows enter the winter in a body condition of 3.0/5(6.0/9). If the cows are thin, feed to gain weight in the mild weather when maintenance requirements are low.

From September weaning to November, it is possible to increase body condition 0.5/9 on low quality grazing with 2-3 pounds of protein supplement three times weekly(MWF). Intermittent feeding of a protein supplement will not accustom the cows to a feeding program and stimulate grazing. Energy will satiate the cows and inhibit grazing. Lusby recommends the use of a natural protein supplement as opposed to a liquid supplement. Possibly it is because of the energy content which will decrease grazing or that intake cannot be controlled. Feed the protein supplement in the morning to stimulate grazing. If energy supplement is

required, feed in the evening on a daily basis. This offers the opportunity to capitalize on residue grazing post weaning on stubble, chaff, slough bottoms and hay fields in late fall.

Productivity is measured in: animal unit months(Aum), pounds of beef produced per acre and pounds wean of weaned calf. Information also monitored: rainfall by month, time spent on each paddock of a pasture in a stack graph and supplemental feed and fertilizer used.

Vitamins are not required until fall. TM salt and macro minerals are used based on production group and cost effectiveness (Mathison).

DRYLOT FEEDING

I. BEEF COW

There are three phases of production: weaning to calving, calving to breeding and breeding to weaning. Within this there are five separate production groups: mature cow in good condition, mature cow in thin condition, first calf heifers, pregnant replacement heifers and heifer calves. Cow condition in the fall will determine which group she should be placed into. Potentially, there would be five different feeding groups. The number of feeding groups can be decreased to three by combining thin cows, first calf heifers and pregnant replacements. These three groups must gain weight through the winter period.

a. WEANING TO CALVING

Post weaning and prior to winter, requirements can be met by foraging on stubble. If the three groups which require weight gain are also put on stubble forage, my feeling is that a natural protein supplement could be well utilized. Stubble is deficient in crude protein and this limits daily DMI. It has been shown that natural protein supplementation will stimulate in an attempt to increase energy intake to match protein intake. This would maximize utilization of a low cost energy source.

If the cow's weight has been maintained throughout the winter, then feed can be increased six weeks prior to calving to compensate for calf growth and prepare for lactation.

There are five female feeding groups in the reproductive herd. These include:

a) non pregnant replacements
b) pregnant replacements
c) pregnant first calf heifers
d) pregnant mature cows in thin condition

and e) pregnant mature cows in good condition. The number of groups can be reduced to three by combining the mid three groups as time and space requires.

During the fall visit the winter rations are formulated. The rations are: weaning, backgrounding, feeders, replacements to maintain body condition 6.0/9, preg replacements to body condition 6.0/9, mature cows 2nd and 3rd trimester, lactating cow ration average/superior production.

A minimum of five rations are formulated in the fall for the breeding herd. These include:

a) non pregnant heifer replacement. When the animals are weighed at weaning, the breeding weight is targeted and ration formulated to meet that target.

b) pregnant heifer replacement. The pregnant heifer is fed to meet and maintain a body condition of 6.0/9 through calving to breeding if possible. These females are usually grazed on marginal feeds in the fall with the cow herd and their body condition must be monitored so not to allow them to drop below a body condition of 5.0/9. Certainly the feeding program should be satisfactory for the last trimester.

c) mature cows second trimester. Depending on the forage and severity of the season, the ration is usually adequate with forage, free choice minerals and free choice vitamins. It is my preference to balance any ration with at least 10 percent protein regardless of NRC recommendations for good rumen microbial function.

d) mature cows third trimester. This ration should compensate for environmental temperature and cow condition coming up to calving.

e) lactating cow ration. Formulate ration for average or superior milking cows. Cow condition and calf milk scours are the concerns with feeding. The lactating ration is balanced to 120/130% of NRC depending on the weather and milk scours.

With early calving, the cattle are in drylot until the calves are 3-5 months of age. Some of the herds were developing serious coccidiosis in the calves. Considering the expense of slow release sulfas, it was decided to prescribe a beef creep supplement. The reference is the NRC 1989 Dairy Calf requirements. It is made up in a barley base and there is no attempt to make the calves to grow any faster. The supplement is mixed with oats to correlate with the daily intake of the calves. The vitamins and minerals

are added with the expectation of improving the health and inherent immunity of the calf. One herd managed their way out of coccidiosis by moving the calves out into larger fields as early as February.

TABLE BEEF CREEP SUPPLEMENT WITH DECCOX MAR 24/89

FEED AT RATE OF 1GM/KG BODYWEIGHT WITH OATS

DECCOX 7.5 KG/TONNE

CA	40 G/KG	SE	5 MG/KG	VIT A	30,000 IU/KG
P	20 G/KG	CU	200 MG/KG	VIT D	6,000 IU/KG
MG	5 G/KG	ZN	800 MG/KG	VIT E	1,000 IU/KG
		MN	800 MG/KG		
		FE	1000 MG/KG		

b. CALVING TO REBREEDING

The highest requirement is during this phase to meet the demands of lactation. Good nutrition is essential for resolution of the uterus, quick return to estrus, early breeding and good conception rates. The cattle are usually on pasture at breeding, therefore consideration should be given to the adequacy of the pasture to keep the cow gaining weight.

c. BREEDING TO WEANING

Nutrient requirements decline toward weaning as the calf's DMI increases. Lactation also decreases during this time period.

II. BACKGROUNDERS AND FEEDERS

Growth of calves preweaning determines the quality and quantity of protein allowance necessary for the ration. If the choice of the producer is to background calves, then ensure an adequate level of protein with a limit on energy to control excess fleshing. Fleshing will be dependent on the quality of cattle. If the choice of the producer is to finish, then background to 700 pounds and work to the finishing ration.

There are three feeding methods present on small farms: total mixed rations(TMR), mixmill and self feeder and trough fed grain.

Feeding allowance for most nutrients is 10-20% over NRC requirements. Protein allowance is essential for good performance. A natural or bypass protein source is recommended until 700 pounds. Protein is balanced to 2% over NRC requirements especially to exotics.

Total Mixed Rations (TMR): Although it is not common, some producers are purchasing mixing wagons for feeding cattle. This introduces the possibility of developing total mixed rations. In this discussion TMR are silage based rations and are offered fresh daily or twice daily. TMR offers the best control and best results in feed utilization and rate of gain. No other feed source is offered such as a round bale of hay in a self feeder in the pen. Days to market have been decreased by 60 days when compared to the self feeder system, which eliminates the maintenance for that time period. It also introduces the opportunity to market the animals in March and early April before slaughter supply increases when the majority of yearlings are marketed in May and June. Even with Tripartite, the marketing skills of the producer are important.

Four to six rations with a 30-85% concentrate on a dry matter (DM) basis are formulated for the feeder-finisher operation. Backgrounded calves and feeders less than 700 pounds are only offered rations up to 50:50 forage:concentrate ratio DM. Bunks are read on a daily or twice daily basis just prior to feeding to determine the proper amount of feed to prepare. Bad bunk management leads to acidosis, bloat, sickness and poor feed utilization.

The main consideration is bunk management when dealing with total mixed rations for finishing animals. There are some general recommendations which can be offered to producers using bunk feeding and TMR. These recommendations are plagerized from Dr. Dave Hutchison of the Texas Agricultural Experimental Station.

a) deliver feed evenly to the bunk to allow even access over the total feeding period. Deliver feed the total length of the bunk.

b) deliver an adequate amount of ration so the feed is cleaned up for a maximum of 15-20 minutes per day. A small amount of carryover along the bunk with holes in the feed to the bunk surface is desired.

c) never allow a slick bunk. A slick bunk indicates that the pen has been out of feed for a period of time and may lead to acidosis and bloat on reintroduction of a hot ration. Back up one ration when slick bunks occur.

d) feed from the bottom up. Keep feed fresh from bottom to top of the bunk.

e) make adjustments daily as you go. Feeding is dynamic and influenced by health, weather, feed quality and errors.

f) no water in the bunk: shovel or drain.

g) no fecal material in the bunk: shovel.

h) no moldy feed in the bunk: shovel. The shovel should be hung on the feed wagon so the operator can clean the bunk before feeding.

i) clean waterers daily. Dry matter intake is directly related to water intake.

k) feed fresh feed and avoid stale feed. Use high quality silage and roughage.
l) freshness usually lasts only 12 hours, especially in warm weather and with high moisture silage. If the weather is extremely hot, then feed twice daily with 2/3 of the daily ration being fed in the afternoon. Consumption will be higher in the cooler hours.
m) if the animals get upset and back off feed, then back up two rations.

Self Feeder System: The self feeder system usually consists of a grain, straw, hay and supplement ration processed by a grinder mixer and placed in a self feeder. A source of forage is offered in feeder or silage is offered on a daily basis.

There is a problem with bloat when legumes are ground into the mixmill to dilute the grain. Energy in the ration is limited when straw is used to dilute the grain. Bypass protein should be proportionately higher in lower energy ration to attempt adequate absorption of protein. Feed wastage and prediction of DMI is also a problem when formulating the ration.

Trough Feeding System: Bloat and acidosis are more of a problem with pulse feeding of grain. One modification is to increase the feeding frequency to stabilize the pH level of the rumen.

The ration can be monitored while penchecking by observing the stools. The desired stool from a stationary animal is a nice cow pie which is indented in the center. A long thin stream into flat splatters like a cow on fresh grass is not desireable since it indicates a digestive upset. A hard lumpy stool like a cow on dry pasture is not desireable since it indicated suboptimum production. Ten percent white caps are tolerated. White caps indicate a sluffing of the ruminal epithelium and marginal acidosis. Personally that is too close for comfort.

FEED QUALITY AND STORAGE

Forage quality is determined by stage of maturity, harvest losses, storage losses and feeding losses.

Harvest losses are due to stage of maturity, leaf loss, and spoilage when baling at too high moisture. Feed preservatives are still of questionable value. Spoilage not only decreases the feed quality but it also increases the susceptibility to disease due to molds.

Poor storage of large round bales is one of the greatest losses in this region. Failure to deck the bales and no consideration of ground or cover leads to storage and feeding loss. With round bales, storage and feeding loss, in a Missouri, study demonstrated a 39.7% loss stored uncovered on the ground compared to 19.7% loss stored outside three high covered and 14.8% loss stored inside. This is an extreme case which occurred with 58 centimeters of rain. The seasonal rainfall in the Prince Albert region is somewhat less but forage deterioration is still a problem.

Forage quality determines dry matter intake(DMI) and ability to meet the requirements for the present production of the animal. Feed testing, feed cost comparisons and ration balancing has been very enlightening to the producers to demonstrate the value of improving forage quality to reduce the necessity of energy and protein supplementation.

It is important to remember that the 1984 Beef Cattle NRC tables are derived to meet the requirements of 80% of the cattle in each category in thermal neutral conditions. Thermal neutral conditions are at a temperature of 6°C to 20°C, calm and dry.

TABLE

CONSUMPTION EST. OF DIFFERENT FEEDSTUFFS ON 90% DM

FEEDSTUFF	DMI %BODYWEIGHT
Excellent hay	3.0
Good quality hay	2.5
Medium quality hay	2.0
Poor quality hay	1.5
Oat and barley straw	1.5
Wheat straw	1.0
Silage	2.3
Oat grain	3.0
Barley grain	2.5

TABLE

ENERGY AND PROTEIN CONTENT OF FEEDSTUFF AT 90% DM BASIS

FEED	ME Mcal/kg	TDN %	CP %
Barley straw	1.62	48	3.9
Medium br-alf	1.98	54	7.4
Good br-alf	2.18	57	12.2
Excellent alf	2.20	59	18.3
Corn silage	2.38	60	8.0
Barley silage	2.3	60	10.8
Barley	2.94	77	13.9

TABLE

REQUIREMENTS OF 550 KG COW THERMAL NEUTRAL CONDITION

TERM	ADG	DMI	DAILY REQ			% OF DIET		
			ME	TDN	CP	ME	TDN	CP
	KG	KG	MCAL	KG	KG	MCAL/KG	%	%
2nd trim.	0	9.5	16.7	4-6	.657	1.76	48.6	6.4
3rd trim.	.4	10.2	19.5	5.4	.790	1.91	52.8	7.8
lactating								
5 kg/day	0	10.6	21.5	5.9	1.00	2.03	56.1	9.5
10 kg/day	0	10.9	25.8	7.1	1.30	2.38	65.8	12.0

TABLE

FORAGE ABILITY TO MEET REQ. OF 550 KG COW THERM NEUT COND.

FORAGE	EST. MAX DMI (KG)	2ND TRIM DMIR (KG)	BAL E	BAL P	3RD TRIM DMIR (KG)	BAL E	BAL P	LACTATING DMIR (KG)	BAL E	BAL P
barley str.	8.25	10.3	-	-	12.0	-	-	13.27	-	-
Med. br-alf	11.0	8.43	+	+	9.85	+	+^	10.86	+	-
good br-alf	13.7	7.66	+	+	8.94	+	+	9.86	+	+
corn silage	13.75	7.02	+	-	8.19	+	-	9.03	+	-
barley sil	13.75	7.26	+	+	8.48	+	+	9.35	+	+

E - energy P - protein

^only at maximum intake therefore protein supplement required 10.7% CP to meet protein requirement over energy therefore protein supplement to meet requirement.

EFFECT OF TEMPERATURE ON ENERGY BALANCE

Once the temperature (-20°C there is a problem with adequate energy intake. This effect is exacerbated by a low energy diet. As energy requirements increase and there is a failure to meet the requirements in the diet; catabolism occurs and increased ammonia is found the urine. Digestibility decreases 1.8% for every 10°C. below +20°C. As a rule of thumb increase feed by 2% for every 10°C below +20°C. If maximum feed intake is met by the present ration then grain will have to be added to the ration.

STRESS FACTORS

Other effects can be related to cold stress such as wind, snow/rain, animal hair coat, condition of cow and solar radiation. Therefore provide shelter and bedding to reduce feed requirements.

TABLE WIND FACTORS WITH DIFFERENT HAIR COATS

WIND SPEED	TEMP °CENTIGRADE		
KM/HR	-1	-12	-23
0	-1	-12	-23
16	-7.7	-18.3	-29.4
32	-12.8	-23.3	-34.4
64	-38.9	-50	-61.1

TABLE HAIR COAT TYPE

%INCREASE IN ME REQUMT/°C OF COLDNESS FROM 0°C

	360 kg cow	550 kg cow
heavy coat	1.25	1.1
light coat	2.0	1.8
wet coat	3.6	3.4

MINERALS

Recommended daily allowances for trace minerals(TM) are available in the Alberta Agricultures Beef Herd Management Guide. Provincial averages and ranges are available but the determination of TM in local feeds is expensive. In many areas, livestock specialists have determined TM values on significant minerals on a number and variety of feedstuffs. It is then possible to use your best judgment on the safe TM values for local feedstuffs and enter them into the library templates.

trace mineral: Cu Zn Mn Se

salt: Co I

calcium phosphorus:

hay ration 1:1

straw/grain 2:1

VITAMINS

VIT A:

precalving: 40,000 IU/day

postcalving: 70,000 IU/day

Included are observations that have been noted in producer feeding programs:

a) inadequate energy, natural protein, minerals and vitamins in the weaning ration. This is the most critical time period which is handled in a careless manner. It would cause one to question the host response to disease and vaccination.

b) There is a limit to energy in self feeder rations which will not cause acidosis. Most producers will make their hottest ration in the mixmill 1/3 grain and 2/3 straw by volume which converts to 2/3 grain and 1/3 straw by weight.

c) There is frequently inadequate calcium in the finisher rations. It can take up to 150 grams of limestone/head/day to balance the Ca:P ratio in the top grain:straw or grain:grain silage ration.

d) Mg and Mn are deficient in totally grain/straw based diets. Ensure that the mineral supplement has an adequate amount of each and is being consumed.

f) Vitamin A is extensively degraded in heavy grain rations. Supplement adequately in the feed or inject Vit ADE.

g) Feeding with the trough system causes acidotic conditions in the rumen after each feeding. Problems are complicated by inconsistent feeding.

h) Liquid protein supplements are convenient and improve deficiencies, but there are better sources of protein that are more cost effective. When the producer is not incline to go to any extra trouble, tolerate the lick tank.

RATION BALANCING

Forage tests are taken by the technician in the early fall and sent to the feed test lab. prior to the fall rush. Grain samples can be brought in by the producer or collected at the fall visit if not in the bin at the time the forage samples are taken. The program will not work unless a forage collection service is included. Presently the cost is less than $50.00 per producer before lab fees.

In order to be expedient and accurate with ration balancing, a computer program is required. The novelty of ration formulation wears off fairly rapidly even when only balancing for the four major ingredients. Software costs varies from no cost to several thousand dollars for the feed company models. Some programs only balance for the four major ingredients and other programs will monitor any number of ingredients on a hit and miss basis to a least costing program. The program should monitor bypass protein, vitamins and trace minerals in order to be useful.

Ration2, a Lotus spreadsheet program, was developed by W. Dietz, Alberta Agriculture, Vermillion, Alberta. It tracks energy as DE, protein, vit A, vit D, and trace minerals. The program has been altered by myself to Ration9 and Ration10, a VP Planner Plus spreadsheet, to also track energy as TDN, protein, bypass protein & vit E and has a requirement table and customer feed template library. This is the software which I use most frequently when leastcosting is not required.

I have other leastcost ration formulation programs which are used on occasion but they are more cumbersome and intricate. Therefore when producing a series of rations for a producer and most of the products are home produced, I use the spreadsheet.

One should be conscious of the quantity and quality of feedstuffs available to complement production and consumption. Recommend daily allowances have been developed by Alberta Agriculture which is higher than the 1984 NRC requirements.

In conclusion, nutrition is a significant segment of beef herd management. It is dynamic and flexible to meet the demands of environment and production. Consideration should be given to deficiencies in the feeding system whether it is the dry lot or grazing which have a negative economic impact. Where necessary refer the problem to regional specialists. Ration formulation is based on NRC values as a guideline, with allowances given for genetics and environment. Balancing should include the fat soluble vitamins and trace minerals. Computerization has become a necessity in order to bring mass ration formulation into the realm of reality.

REFERENCES

Alberta Agriculture, Beef herd management, reference binder and study guide. Beef Cattle and Sheep Branch

Belyea et al., Storage and feeding losses of large round bales. 1985 J. Dairy Sci 68:3371-3375

Lusby K.S. and Selk G.E., The use of body condition in management of beef cattle reproduction programs. Oklahoma State University

Mathison G.W., Supplementing minerals in the cow-calf operation. Managing in Changing Times Conference Proceedings, Sept. 16,1986

Preston Thornton R.L., Typical composition of feeds for cattle, sheep, 1988-89. Feedstuffs Oct. 17,1988